

SEQUENCE LISTING

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 KUSCHINSKY, WOLFGANG
 SCHNEIDER, ARMIN

<120> A PROCESS FOR IN VITRO DIFFERENTIATION OF NEURAL STEM
 CELLS OR OF CELLS DERIVED FROM NEURONAL STEM CELLS

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<140> 10/584,341

<141> 2006-06-23

<150> PCT/EP04/014673

<151> 2004-12-23

<150> DE 10361444.3

<151> 2003-12-23

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<170> PatentIn Ver. 3.3

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<212> PRT

<213> Homo sapiens

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Lys Gly Asn Pro Glu Glu Glu Asp Val Asp Thr Ser Gln Val Leu Tyr
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Glu Trp Glu Gln Gly Phe Ser Gln Ser Phe Thr Gln Glu Gln Val Ala
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Asp Ile Asp Gly Gln Tyr Ala Met Thr Arg Ala Gln Arg Val Arg Ala
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Ala Met Phe Pro Glu Thr Leu Asp Glu Gly Met Gln Ile Pro Ser Thr
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Gln Phe Asp Ala Ala His Pro Thr Asn Val Gln Arg Leu Ala Glu Pro
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Ser Gln Met Leu Lys His Ala Val Val Asn Leu Ile Asn Tyr Gln Asp
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Asn	Asp	Glu	Asp	Gln	Val	Val	Val	Asn	Lys	Ala	Ala	Val	Met	Val	His		165	170				175
Gln	Leu	Ser	Lys	Lys	Glu	Ala	Ser	Arg	His	Ala	Ile	Met	Arg	Ser	Pro		180	185				190
Gln	Met	Val	Ser	Ala	Ile	Val	Arg	Thr	Met	Gln	Asn	Thr	Asn	Asp	Val		195	200				205
Glu	Thr	Ala	Arg	Cys	Thr	Ala	Gly	Thr	Leu	His	Asn	Leu	Ser	His	His		210	215				220
Arg	Glu	Gly	Leu	Leu	Ala	Ile	Phe	Lys	Ser	Gly	Gly	Ile	Pro	Ala	Leu		225	230				235
Val	Lys	Met	Leu	Gly	Ser	Pro	Val	Asp	Ser	Val	Leu	Phe	Tyr	Ala	Ile		245	250				255
Thr	Thr	Leu	His	Asn	Leu	Leu	Leu	His	Gln	Glu	Gly	Ala	Lys	Met	Ala		260	265				270
Val	Arg	Leu	Ala	Gly	Gly	Leu	Gln	Lys	Met	Val	Ala	Leu	Leu	Asn	Lys		275	280				285
Thr	Asn	Val	Lys	Phe	Leu	Ala	Ile	Thr	Thr	Asp	Cys	Leu	Gln	Ile	Leu		290	295				300
Ala	Tyr	Gly	Asn	Gln	Glu	Ser	Lys	Leu	Ile	Ile	Leu	Ala	Ser	Gly	Gly		305	310				315
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Val	Thr	Cys	Ala	Ala	Gly	Ile	Leu	Ser	Asn	Leu	Thr	Cys	Asn	Asn	Tyr		420	425				430
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Ser	Gly	Gly	Tyr	Gly	Gln	Asp	Ala	Leu	Gly	Met	Asp	Pro	Met	Met	Glu		
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His	Glu	Met	Gly	Gly	His	His	Pro	Gly	Ala	Asp	Tyr	Pro	Val	Asp	Gly		
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Asp Gly Ser Lys Val Thr Thr Val Val Ala Thr Pro Gly Gln Gly Pro
 35 40 45

Asp Arg Pro Gln Glu Val Ser Tyr Thr Asp Thr Lys Val Ile Gly Asn
 50 55 60

Gly Ser Phe Gly Val Val Tyr Gln Ala Lys Leu Cys Asp Ser Gly Glu
 65 70 75 80

Leu Val Ala Ile Lys Lys Val Leu Gln Asp Lys Arg Phe Lys Asn Arg
 85 90 95

Glu Leu Gln Ile Met Arg Lys Leu Asp His Cys Asn Ile Val Arg Leu
 100 105 110

Arg Tyr Phe Phe Tyr Ser Ser Gly Glu Lys Lys Asp Glu Val Tyr Leu
 115 120 125

Asn Leu Val Leu Asp Tyr Val Pro Glu Thr Val Tyr Arg Val Ala Arg
 130 135 140

His Tyr Ser Arg Ala Lys Gln Thr Leu Pro Val Ile Tyr Val Lys Leu
 145 150 155 160

Tyr Met Tyr Gln Leu Phe Arg Ser Leu Ala Tyr Ile His Ser Phe Gly
 165 170 175

Ile Cys His Arg Asp Ile Lys Pro Gln Asn Leu Leu Leu Asp Pro Asp
 180 185 190

Thr Ala Val Leu Lys Leu Cys Asp Phe Gly Ser Ala Lys Gln Leu Val
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Pro Leu Leu Leu Gly Val Arg Ala Gln Ala Ala Gly Gln Gly Pro Gly
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Phe	Thr	Val	Leu	Thr	Tyr	Leu	Val	Asp	Met	Arg	Arg	Phe	Ser	Tyr	Pro	
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 Ser Ser Ile Trp Trp Val Ile Leu Ser Leu Thr Trp Phe Leu Ala Ala
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 Gly Met Lys Trp Gly His Glu Ala Ile Glu Ala Asn Ser Gln Tyr Phe
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 His Leu Ala Ala Trp Ala Val Pro Ala Ile Lys Thr Ile Thr Ile Leu
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 485 490 495
 Phe Val Tyr Leu Phe Ile Gly Thr Ser Phe Leu Leu Ala Gly Phe Val
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 Ser Leu Phe Arg Ile Arg Thr Ile Met Lys His Asp Gly Thr Lys Thr
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 Glu Lys Leu Glu Lys Leu Met Val Arg Ile Gly Val Phe Ser Val Leu
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 Tyr Thr Val Pro Ala Thr Ile Val Ile Ala Cys Tyr Phe Tyr Glu Gln
 545 550 555 560
 Ala Phe Arg Asp Gln Trp Glu Arg Ser Trp Val Ala Gln Ser Cys Lys
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 Ser Tyr Ala Ile Pro Cys Pro His Leu Gln Ala Gly Gly Gly Ala Pro
 580 585 590
 Pro His Pro Pro Met Ser Pro Asp Phe Thr Val Phe Met Ile Lys Tyr
 595 600 605
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Ala	Pro	Val	Cys	Thr	Val	Leu	Glu	Gln	Ala	Ile	Pro	Pro	Cys	Arg	Ser
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Gly	Gly	Thr	Pro	Gly	Gly	Pro	Gly	Gly	Gly	Gly	Ala	Pro	Pro	Arg	Tyr
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Ala	Thr	Leu	Glu	His	Pro	Phe	His	Cys	Pro	Arg	Val	Leu	Lys	Val	Pro
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Thr	Arg	Phe	Ala	Arg	Leu	Trp	Ile	Leu	Thr	Trp	Ser	Val	Leu	Cys	Cys
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Ala	Ser	Thr	Phe	Phe	Thr	Val	Thr	Thr	Tyr	Leu	Val	Asp	Met	Gln	Arg
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Ser	Gln	Tyr	Phe	His	Leu	Ala	Ala	Trp	Ala	Val	Pro	Ala	Val	Lys	Thr
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Ala	Gly	Phe	Val	Ser	Leu	Phe	Arg	Ile	Arg	Thr	Ile	Met	Lys	His	Asp
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Gly	Thr	Lys	Thr	Glu	Lys	Leu	Glu	Arg	Leu	Met	Val	Arg	Ile	Gly	Val
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Phe	Tyr	Glu	Gln	Ala	Phe	Arg	Glu	His	Trp	Glu	Arg	Ser	Trp	Val	Ser
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<213> Homo sapiens

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Tyr	Ala	Val	Cys	Tyr	Met	Met	Val	Ser	Leu	Ile	Phe	Phe	Ile	Gly	Phe
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Leu	Leu	Glu	Asp	Arg	Val	Ala	Cys	Asn	Ala	Ser	Ile	Pro	Ala	Gln	Tyr
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Gly	Ile	Pro	Gly	Thr	Leu	Thr	Ile	Ile	Leu	Leu	Ala	Met	Asn	Lys	Ile	340	345		350
Glu	Gly	Asp	Asn	Ile	Ser	Gly	Val	Cys	Phe	Val	Gly	Leu	Tyr	Asp	Val	355	360		365
Asp	Ala	Leu	Arg	Tyr	Phe	Val	Leu	Ala	Pro	Leu	Cys	Leu	Tyr	Val	Val	370	375		380
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Trp	Val	Gly	Ser	Lys	Lys	Thr	Cys	Phe	Glu	Trp	Ala	Ser	Phe	Phe	His	500	505		510
Gly	Arg	Arg	Lys	Lys	Glu	Ile	Val	Asn	Glu	Ser	Arg	Gln	Val	Leu	Gln	515	520		525
Glu	Pro	Asp	Phe	Ala	Gln	Ser	Leu	Leu	Arg	Asp	Pro	Asn	Thr	Pro	Ile	530	535		540
Ile	Arg	Lys	Ser	Arg	Gly	Thr	Ser	Thr	Gln	Gly	Thr	Ser	Thr	His	Ala	545	550		555
Ser	Ser	Thr	Gln	Leu	Ala	Met	Val	Asp	Asp	Gln	Arg	Ser	Lys	Ala	Gly	565	570		575
Ser	Ile	His	Ser	Lys	Val	Ser	Ser	Tyr	His	Gly	Ser	Leu	His	Arg	Ser	580	585		590
Arg	Asp	Gly	Arg	Tyr	Thr	Pro	Cys	Ser	Tyr	Arg	Gly	Met	Glu	Glu	Arg	595	600		605

Leu Pro His Gly Ser Met Ser Arg Leu Thr Asp His Ser Arg His Ser
 610 615 620
 Ser Ser His Arg Leu Asn Glu Gln Ser Arg His Ser Ser Ile Arg Asp
 625 630 635 640
 Leu Ser Asn Asn Pro Met Thr His Ile Thr His Gly Thr Ser Met Asn
 645 650 655
 Arg Val Ile Glu Glu Asp Gly Thr Ser Ala
 660 665

<210> 6
 <211> 537
 <212> PRT
 <213> Homo sapiens

<400> 6
 Met Ala Trp Arg Gly Ala Gly Pro Ser Val Pro Gly Ala Pro Gly Gly
 1 5 10 15
 Val Gly Leu Ser Leu Gly Leu Leu Leu Gln Leu Leu Leu Leu Gly
 20 25 30
 Pro Ala Arg Gly Phe Gly Asp Glu Glu Glu Arg Arg Cys Asp Pro Ile
 35 40 45
 Arg Ile Ser Met Cys Gln Asn Leu Gly Tyr Asn Val Thr Lys Met Pro
 50 55 60
 Asn Leu Val Gly His Glu Leu Gln Thr Asp Ala Glu Leu Gln Leu Thr
 65 70 75 80
 Thr Phe Thr Pro Leu Ile Gln Tyr Gly Cys Ser Ser Gln Leu Gln Phe
 85 90 95
 Phe Leu Cys Ser Val Tyr Val Pro Met Cys Thr Glu Lys Ile Asn Ile
 100 105 110
 Pro Ile Gly Pro Cys Gly Gly Met Cys Leu Ser Val Lys Arg Arg Cys
 115 120 125
 Glu Pro Val Leu Lys Glu Phe Gly Phe Ala Trp Pro Glu Ser Leu Asn
 130 135 140
 Cys Ser Lys Phe Pro Pro Gln Asn Asp His Asn His Met Cys Met Glu
 145 150 155 160
 Gly Pro Gly Asp Glu Glu Val Pro Leu Pro His Lys Thr Pro Ile Gln
 165 170 175
 Pro Gly Glu Glu Cys His Ser Val Gly Thr Asn Ser Asp Gln Tyr Ile
 180 185 190
 Trp Val Lys Arg Ser Leu Asn Cys Val Leu Lys Cys Gly Tyr Asp Ala
 195 200 205

Gly Leu Tyr Ser Arg Ser Ala Lys Glu Phe Thr Asp Ile Trp Met Ala
 210 215 220
 Val Trp Ala Ser Leu Cys Phe Ile Ser Thr Ala Phe Thr Val Leu Thr
 225 230 235 240
 Phe Leu Ile Asp Ser Ser Arg Phe Ser Tyr Pro Glu Arg Pro Ile Ile
 245 250 255
 Phe Leu Ser Met Cys Tyr Asn Ile Tyr Ser Ile Ala Tyr Ile Val Arg
 260 265 270
 Leu Thr Val Gly Arg Glu Arg Ile Ser Cys Asp Phe Glu Glu Ala Ala
 275 280 285
 Glu Pro Val Leu Ile Gln Glu Gly Leu Lys Asn Thr Gly Cys Ala Ile
 290 295 300
 Ile Phe Leu Leu Met Tyr Phe Phe Gly Met Ala Ser Ser Ile Trp Trp
 305 310 315 320
 Val Ile Leu Thr Leu Thr Trp Phe Leu Ala Ala Gly Leu Lys Trp Gly
 325 330 335
 His Glu Ala Ile Glu Met His Ser Ser Tyr Phe His Ile Ala Ala Trp
 340 345 350
 Ala Ile Pro Ala Val Lys Thr Ile Val Ile Leu Ile Met Arg Leu Val
 355 360 365
 Asp Ala Asp Glu Leu Thr Gly Leu Cys Tyr Val Gly Asn Gln Asn Leu
 370 375 380
 Asp Ala Leu Thr Gly Phe Val Val Ala Pro Leu Phe Thr Tyr Leu Val
 385 390 395 400
 Ile Gly Thr Leu Phe Ile Ala Ala Gly Leu Val Ala Leu Phe Lys Ile
 405 410 415
 Arg Ser Asn Leu Gln Lys Asp Gly Thr Lys Thr Asp Lys Leu Glu Arg
 420 425 430
 Leu Met Val Lys Ile Gly Val Phe Ser Val Leu Tyr Thr Val Pro Ala
 435 440 445
 Thr Cys Val Ile Ala Cys Tyr Phe Tyr Glu Ile Ser Asn Trp Ala Leu
 450 455 460
 Phe Arg Tyr Ser Ala Asp Asp Ser Asn Met Ala Val Glu Met Leu Lys
 465 470 475 480
 Thr Phe Met Ser Leu Leu Val Gly Ile Thr Ser Gly Met Trp Ile Trp
 485 490 495
 Ser Ala Lys Ser Leu His Thr Trp Gln Lys Cys Ser Asn Arg Leu Val
 500 505 510

Asn Ser Gly Lys Val Lys Arg Glu Lys Arg Gly Asn Gly Trp Val Lys
 515 520 525

Pro Gly Lys Gly Ser Glu Thr Val Val
 530 535

<210> 7
 <211> 585
 <212> PRT
 <213> Homo sapiens

<400> 7
 Met Ala Arg Pro Asp Pro Ser Ala Pro Pro Ser Leu Leu Leu Leu Leu
 1 5 10 15

Leu Ala Gln Leu Val Gly Arg Ala Ala Ala Ser Lys Ala Pro Val
 20 25 30

Cys Gln Glu Ile Thr Val Pro Met Cys Arg Gly Ile Gly Tyr Asn Leu
 35 40 45

Thr His Met Pro Asn Gln Phe Asn His Asp Thr Gln Asp Glu Ala Gly
 50 55 60

Leu Glu Val His Gln Phe Trp Pro Leu Val Glu Ile Gln Cys Ser Pro
 65 70 75 80

Asp Leu Arg Phe Phe Leu Cys Thr Met Tyr Thr Pro Ile Cys Leu Pro
 85 90 95

Asp Tyr His Lys Pro Leu Pro Pro Cys Arg Ser Val Cys Glu Arg Ala
 100 105 110

Lys Ala Gly Cys Ser Pro Leu Met Arg Gln Tyr Gly Phe Ala Trp Pro
 115 120 125

Glu Arg Met Ser Cys Asp Arg Leu Pro Val Leu Gly Arg Asp Ala Glu
 130 135 140

Val Leu Cys Met Asp Tyr Asn Arg Ser Glu Ala Thr Thr Ala Pro Pro
 145 150 155 160

Arg Pro Phe Pro Ala Lys Pro Thr Leu Pro Gly Pro Pro Gly Ala Pro
 165 170 175

Ala Ser Gly Gly Glu Cys Pro Ala Gly Gly Pro Phe Val Cys Lys Cys
 180 185 190

Arg Glu Pro Phe Val Pro Ile Leu Lys Glu Ser His Pro Leu Tyr Asn
 195 200 205

Lys Val Arg Thr Gly Gln Val Pro Asn Cys Ala Val Pro Cys Tyr Gln
 210 215 220

Pro Ser Phe Ser Ala Asp Glu Arg Thr Phe Ala Thr Phe Trp Ile Gly
 225 230 235 240

Leu Trp Ser Val Leu Cys Phe Ile Ser Thr Ser Thr Thr Val Ala Thr
 245 250 255
 Phe Leu Ile Asp Met Asp Thr Phe Arg Tyr Pro Glu Arg Pro Ile Ile
 260 265 270
 Phe Leu Ser Ala Cys Tyr Leu Cys Val Ser Leu Gly Phe Leu Val Arg
 275 280 285
 Leu Val Val Gly His Ala Ser Val Ala Cys Ser Arg Glu His Asn His
 290 295 300
 Ile His Tyr Glu Thr Thr Gly Pro Ala Leu Cys Thr Ile Val Phe Leu
 305 310 315 320
 Leu Val Tyr Phe Phe Gly Met Ala Ser Ser Ile Trp Trp Val Ile Leu
 325 330 335
 Ser Leu Thr Trp Phe Leu Ala Ala Ala Met Lys Trp Gly Asn Glu Ala
 340 345 350
 Ile Ala Gly Tyr Gly Gln Tyr Phe His Leu Ala Ala Trp Leu Ile Pro
 355 360 365
 Ser Val Lys Ser Ile Thr Ala Leu Ala Leu Ser Ser Val Asp Gly Asp
 370 375 380
 Pro Val Ala Gly Ile Cys Tyr Val Gly Asn Gln Asn Leu Asn Ser Leu
 385 390 395 400
 Arg Arg Phe Val Leu Gly Pro Leu Val Leu Tyr Leu Leu Val Gly Thr
 405 410 415
 Leu Phe Leu Leu Ala Gly Phe Val Ser Leu Phe Arg Ile Arg Ser Val
 420 425 430
 Ile Lys Gln Gly Gly Thr Lys Thr Asp Lys Leu Glu Lys Leu Met Ile
 435 440 445
 Arg Ile Gly Ile Phe Thr Leu Leu Tyr Thr Val Pro Ala Ser Ile Val
 450 455 460
 Val Ala Cys Tyr Leu Tyr Glu Gln His Tyr Arg Glu Ser Trp Glu Ala
 465 470 475 480
 Ala Leu Thr Cys Ala Cys Pro Gly His Asp Thr Gly Gln Pro Arg Ala
 485 490 495
 Lys Pro Glu Tyr Trp Val Leu Met Leu Lys Tyr Phe Met Cys Leu Val
 500 505 510
 Val Gly Ile Thr Ser Gly Val Trp Ile Trp Ser Gly Lys Thr Val Glu
 515 520 525
 Ser Trp Arg Arg Phe Thr Ser Arg Cys Cys Cys Arg Pro Arg Arg Gly
 530 535 540

His Lys Ser Gly Gly Ala Met Ala Ala Gly Asp Tyr Pro Glu Ala Ser
545 550 555 560

Ala Ala Leu Thr Gly Arg Thr Gly Pro Pro Gly Pro Ala Ala Thr Tyr
565 570 575

His Lys Gln Val Ser Leu Ser His Val
580 585

<210> 8

<211> 706

<212> PRT

<213> Homo sapiens

<400> 8

Met Glu Met Phe Thr Phe Leu Leu Thr Cys Ile Phe Leu Pro Leu Leu
1 5 10 15

Arg Gly His Ser Leu Phe Thr Cys Glu Pro Ile Thr Val Pro Arg Cys
20 25 30

Met Lys Met Ala Tyr Asn Met Thr Phe Phe Pro Asn Leu Met Gly His
35 40 45

Tyr Asp Gln Ser Ile Ala Ala Val Glu Met Glu His Phe Leu Pro Leu
50 55 60

Ala Asn Leu Glu Cys Ser Pro Asn Ile Glu Thr Phe Leu Cys Lys Ala
65 70 75 80

Phe Val Pro Thr Cys Ile Glu Gln Ile His Val Val Pro Pro Cys Arg
85 90 95

Lys Leu Cys Glu Lys Val Tyr Ser Asp Cys Lys Lys Leu Ile Asp Thr
100 105 110

Phe Gly Ile Arg Trp Pro Glu Glu Leu Glu Cys Asp Arg Leu Gln Tyr
115 120 125

Cys Asp Glu Thr Val Pro Val Thr Phe Asp Pro His Thr Glu Phe Leu
130 135 140

Gly Pro Gln Lys Lys Thr Glu Gln Val Gln Arg Asp Ile Gly Phe Trp
145 150 155 160

Cys Pro Arg His Leu Lys Thr Ser Gly Gly Gln Gly Tyr Lys Phe Leu
165 170 175

Gly Ile Asp Gln Cys Ala Pro Pro Cys Pro Asn Met Tyr Phe Lys Ser
180 185 190

Asp Glu Leu Glu Phe Ala Lys Ser Phe Ile Gly Thr Val Ser Ile Phe
195 200 205

Cys Leu Cys Ala Thr Leu Phe Thr Phe Leu Thr Phe Leu Ile Asp Val
210 215 220

Arg	Arg	Phe	Arg	Tyr	Pro	Glu	Arg	Pro	Ile	Ile	Tyr	Tyr	Ser	Val	Cys
225					230					235					240
Tyr	Ser	Ile	Val	Ser	Leu	Met	Tyr	Phe	Ile	Gly	Phe	Leu	Leu	Gly	Asp
				245					250					255	
Ser	Thr	Ala	Cys	Asn	Lys	Ala	Asp	Glu	Lys	Leu	Glu	Leu	Gly	Asp	Thr
			260					265					270		
Val	Val	Leu	Gly	Ser	Gln	Asn	Lys	Ala	Cys	Thr	Val	Leu	Phe	Met	Leu
		275					280					285			
Leu	Tyr	Phe	Phe	Thr	Met	Ala	Gly	Thr	Val	Trp	Trp	Val	Ile	Leu	Thr
	290					295					300				
Ile	Thr	Trp	Phe	Leu	Ala	Ala	Gly	Arg	Lys	Trp	Ser	Cys	Glu	Ala	Ile
305					310					315					320
Glu	Gln	Lys	Ala	Val	Trp	Phe	His	Ala	Val	Ala	Trp	Gly	Thr	Pro	Gly
				325					330					335	
Phe	Leu	Thr	Val	Met	Leu	Leu	Ala	Leu	Asn	Lys	Val	Glu	Gly	Asp	Asn
			340					345					350		
Ile	Ser	Gly	Val	Cys	Phe	Val	Gly	Leu	Tyr	Asp	Leu	Asp	Ala	Ser	Arg
		355					360					365			
Tyr	Phe	Val	Leu	Leu	Pro	Leu	Cys	Leu	Cys	Val	Phe	Val	Gly	Leu	Ser
	370					375					380				
Leu	Leu	Leu	Ala	Gly	Ile	Ile	Ser	Leu	Asn	His	Val	Arg	Gln	Val	Ile
385					390					395					400
Gln	His	Asp	Gly	Arg	Asn	Gln	Glu	Lys	Leu	Lys	Lys	Phe	Met	Ile	Arg
				405					410					415	
Ile	Gly	Val	Phe	Ser	Gly	Leu	Tyr	Leu	Val	Pro	Leu	Val	Thr	Leu	Leu
		420						425					430		
Gly	Cys	Tyr	Val	Tyr	Glu	Gln	Val	Asn	Arg	Ile	Thr	Trp	Glu	Ile	Thr
		435					440					445			
Trp	Val	Ser	Asp	His	Cys	Arg	Gln	Tyr	His	Ile	Pro	Cys	Pro	Tyr	Gln
	450					455					460				
Ala	Lys	Ala	Lys	Ala	Arg	Pro	Glu	Leu	Ala	Leu	Phe	Met	Ile	Lys	Tyr
465					470					475					480
Leu	Met	Thr	Leu	Ile	Val	Gly	Ile	Ser	Ala	Val	Phe	Trp	Val	Gly	Ser
				485					490					495	
Lys	Lys	Thr	Cys	Thr	Glu	Trp	Ala	Gly	Phe	Phe	Lys	Arg	Asn	Arg	Lys
			500					505					510		
Arg	Asp	Pro	Ile	Ser	Glu	Ser	Arg	Arg	Val	Leu	Gln	Glu	Ser	Cys	Glu
		515					520					525			

Phe Phe Leu Lys His Asn Ser Lys Val Lys His Lys Lys Lys His Tyr
 530 535 540
 Lys Pro Ser Ser His Lys Leu Lys Val Ile Ser Lys Ser Met Gly Thr
 545 550 555 560
 Ser Thr Gly Ala Thr Ala Asn His Gly Thr Ser Ala Val Ala Ile Thr
 565 570 575
 Ser His Asp Tyr Leu Gly Gln Glu Thr Leu Thr Glu Ile Gln Thr Ser
 580 585 590
 Pro Glu Thr Ser Met Arg Glu Val Lys Ala Asp Gly Ala Ser Thr Pro
 595 600 605
 Arg Leu Arg Glu Gln Asp Cys Gly Glu Pro Ala Ser Pro Ala Ala Ser
 610 615 620
 Ile Ser Arg Leu Ser Gly Glu Gln Val Asp Gly Lys Gly Gln Ala Gly
 625 630 635 640
 Ser Val Ser Glu Ser Ala Arg Ser Glu Gly Arg Ile Ser Pro Lys Ser
 645 650 655
 Asp Ile Thr Asp Thr Gly Leu Ala Gln Ser Asn Asn Leu Gln Val Pro
 660 665 670
 Ser Ser Ser Glu Pro Ser Ser Leu Lys Gly Ser Thr Ser Leu Leu Val
 675 680 685
 His Pro Val Ser Gly Val Arg Lys Glu Gln Gly Gly Gly Cys His Ser
 690 695 700
 Asp Thr
 705

<210> 9
 <211> 574
 <212> PRT
 <213> Homo sapiens

<400> 9
 Met Arg Asp Pro Gly Ala Ala Ala Pro Leu Ser Ser Leu Gly Leu Cys
 1 5 10 15
 Ala Leu Val Leu Ala Leu Leu Gly Ala Leu Ser Ala Gly Ala Gly Ala
 20 25 30
 Gln Pro Tyr His Gly Glu Lys Gly Ile Ser Val Pro Asp His Gly Phe
 35 40 45
 Cys Gln Pro Ile Ser Ile Pro Leu Cys Thr Asp Ile Ala Tyr Asn Gln
 50 55 60
 Thr Ile Leu Pro Asn Leu Leu Gly His Thr Asn Gln Glu Asp Ala Gly
 65 70 75 80

Leu	Glu	Val	His	Gln	Phe	Tyr	Pro	Leu	Val	Lys	Val	Gln	Cys	Ser	Pro	85	90	95
Glu	Leu	Arg	Phe	Phe	Leu	Cys	Ser	Met	Tyr	Ala	Pro	Val	Cys	Thr	Val	100	105	110
Leu	Asp	Gln	Ala	Ile	Pro	Pro	Cys	Arg	Ser	Leu	Cys	Glu	Arg	Ala	Arg	115	120	125
Gln	Gly	Cys	Glu	Ala	Leu	Met	Asn	Lys	Phe	Gly	Phe	Gln	Trp	Pro	Glu	130	135	140
Arg	Leu	Arg	Cys	Glu	Asn	Phe	Pro	Val	His	Gly	Ala	Gly	Glu	Ile	Cys	145	150	155
Val	Gly	Gln	Asn	Thr	Ser	Asp	Gly	Ser	Gly	Gly	Pro	Gly	Gly	Gly	Pro	165	170	175
Thr	Ala	Tyr	Pro	Thr	Ala	Pro	Tyr	Leu	Pro	Asp	Leu	Pro	Phe	Thr	Ala	180	185	190
Leu	Pro	Pro	Gly	Ala	Ser	Asp	Gly	Arg	Gly	Arg	Pro	Ala	Phe	Pro	Phe	195	200	205
Ser	Cys	Pro	Arg	Gln	Leu	Lys	Val	Pro	Pro	Tyr	Leu	Gly	Tyr	Arg	Phe	210	215	220
Leu	Gly	Glu	Arg	Asp	Cys	Gly	Ala	Pro	Cys	Glu	Pro	Gly	Arg	Ala	Asn	225	230	235
Gly	Leu	Met	Tyr	Phe	Lys	Glu	Glu	Glu	Arg	Arg	Phe	Ala	Arg	Leu	Trp	245	250	255
Val	Gly	Val	Trp	Ser	Val	Leu	Cys	Cys	Ala	Ser	Thr	Leu	Phe	Thr	Val	260	265	270
Leu	Thr	Tyr	Leu	Val	Asp	Met	Arg	Arg	Phe	Ser	Tyr	Pro	Glu	Arg	Pro	275	280	285
Ile	Ile	Phe	Leu	Ser	Gly	Cys	Tyr	Phe	Met	Val	Ala	Val	Ala	His	Val	290	295	300
Ala	Gly	Phe	Leu	Leu	Glu	Asp	Arg	Ala	Val	Cys	Val	Glu	Arg	Phe	Ser	305	310	315
Asp	Asp	Gly	Tyr	Arg	Thr	Val	Ala	Gln	Gly	Thr	Lys	Lys	Glu	Gly	Cys	325	330	335
Thr	Ile	Leu	Phe	Met	Val	Leu	Tyr	Phe	Phe	Gly	Met	Ala	Ser	Ser	Ile	340	345	350
Trp	Trp	Val	Ile	Leu	Ser	Leu	Thr	Trp	Phe	Leu	Ala	Ala	Gly	Met	Lys	355	360	365
Trp	Gly	His	Glu	Ala	Ile	Glu	Ala	Asn	Ser	Gln	Tyr	Phe	His	Leu	Ala	370	375	380

Ala Trp Ala Val Pro Ala Val Lys Thr Ile Thr Ile Leu Ala Met Gly
 385 390 395 400
 Gln Val Asp Gly Asp Leu Leu Ser Gly Val Cys Tyr Val Gly Leu Ser
 405 410 415
 Ser Val Asp Ala Leu Arg Gly Phe Val Leu Ala Pro Leu Phe Val Tyr
 420 425 430
 Leu Phe Ile Gly Thr Ser Phe Leu Leu Ala Gly Phe Val Ser Leu Phe
 435 440 445
 Arg Ile Arg Thr Ile Met Lys His Asp Gly Thr Lys Thr Glu Lys Leu
 450 455 460
 Glu Lys Leu Met Val Arg Ile Gly Val Phe Ser Val Leu Tyr Thr Val
 465 470 475 480
 Pro Ala Thr Ile Val Leu Ala Cys Tyr Phe Tyr Glu Gln Ala Phe Arg
 485 490 495
 Glu His Trp Glu Arg Thr Trp Leu Leu Gln Thr Cys Lys Ser Tyr Ala
 500 505 510
 Val Pro Cys Pro Pro Gly His Phe Pro Pro Met Ser Pro Asp Phe Thr
 515 520 525
 Val Phe Met Ile Lys Tyr Leu Met Thr Met Ile Val Gly Ile Thr Thr
 530 535 540
 Gly Phe Trp Ile Trp Ser Gly Lys Thr Leu Gln Ser Trp Arg Arg Phe
 545 550 555 560
 Tyr His Arg Leu Ser His Ser Ser Lys Gly Glu Thr Ala Val
 565 570

<210> 10
 <211> 694
 <212> PRT
 <213> Homo sapiens

<400> 10
 Met Glu Trp Gly Tyr Leu Leu Glu Val Thr Ser Leu Leu Ala Ala Leu
 1 5 10 15
 Ala Leu Leu Gln Arg Ser Ser Gly Ala Ala Ala Ser Ala Lys Glu
 20 25 30
 Leu Ala Cys Gln Glu Ile Thr Val Pro Leu Cys Lys Gly Ile Gly Tyr
 35 40 45
 Asn Tyr Thr Tyr Met Pro Asn Gln Phe Asn His Asp Thr Gln Asp Glu
 50 55 60
 Ala Gly Leu Glu Val His Gln Phe Trp Pro Leu Val Glu Ile Gln Cys
 65 70 75 80

Ser Pro Asp Leu Lys Phe Phe Leu Cys Ser Met Tyr Thr Pro Ile Cys
 85 90 95
 Leu Glu Asp Tyr Lys Lys Pro Leu Pro Pro Cys Arg Ser Val Cys Glu
 100 105 110
 Arg Ala Lys Ala Gly Cys Ala Pro Leu Met Arg Gln Tyr Gly Phe Ala
 115 120 125
 Trp Pro Asp Arg Met Arg Cys Asp Arg Leu Pro Glu Gln Gly Asn Pro
 130 135 140
 Asp Thr Leu Cys Met Asp Tyr Asn Arg Thr Asp Leu Thr Thr Ala Ala
 145 150 155 160
 Pro Ser Pro Pro Arg Arg Leu Pro Pro Pro Pro Gly Glu Gln Pro
 165 170 175
 Pro Ser Gly Ser Gly His Gly Arg Pro Pro Gly Ala Arg Pro Pro His
 180 185 190
 Arg Gly Gly Gly Arg Gly Gly Gly Gly Gly Asp Ala Ala Ala Pro Pro
 195 200 205
 Ala Arg Gly Gly Gly Gly Gly Gly Lys Ala Arg Pro Pro Gly Gly Gly
 210 215 220
 Ala Ala Pro Cys Glu Pro Gly Cys Gln Cys Arg Ala Pro Met Val Ser
 225 230 235 240
 Val Ser Ser Glu Arg His Pro Leu Tyr Asn Arg Val Lys Thr Gly Gln
 245 250 255
 Ile Ala Asn Cys Ala Leu Pro Cys His Asn Pro Phe Phe Ser Gln Asp
 260 265 270
 Glu Arg Ala Phe Thr Val Phe Trp Ile Gly Leu Trp Ser Val Leu Cys
 275 280 285
 Phe Val Ser Thr Phe Ala Thr Val Ser Thr Phe Leu Ile Asp Met Glu
 290 295 300
 Arg Phe Lys Tyr Pro Glu Arg Pro Ile Ile Phe Leu Ser Ala Cys Tyr
 305 310 315 320
 Leu Phe Val Ser Val Gly Tyr Leu Val Arg Leu Val Ala Gly His Glu
 325 330 335
 Lys Val Ala Cys Ser Gly Gly Ala Pro Gly Ala Gly Gly Ala Gly Gly
 340 345 350
 Ala Gly Gly Ala Ala Ala Gly Ala Gly Ala Ala Gly Ala Gly Ala Gly
 355 360 365
 Gly Pro Gly Gly Arg Gly Glu Tyr Glu Glu Leu Gly Ala Val Glu Gln
 370 375 380

His	Val	Arg	Tyr	Glu	Thr	Thr	Gly	Pro	Ala	Leu	Cys	Thr	Val	Val	Phe	385	390	395	400
Leu	Leu	Val	Tyr	Phe	Phe	Gly	Met	Ala	Ser	Ser	Ile	Trp	Trp	Val	Ile	405	410	415	
Leu	Ser	Leu	Thr	Trp	Phe	Leu	Ala	Ala	Gly	Met	Lys	Trp	Gly	Asn	Glu	420	425	430	
Ala	Ile	Ala	Gly	Tyr	Ser	Gln	Tyr	Phe	His	Leu	Ala	Ala	Trp	Leu	Val	435	440	445	
Pro	Ser	Val	Lys	Ser	Ile	Ala	Val	Leu	Ala	Leu	Ser	Ser	Val	Asp	Gly	450	455	460	
Asp	Pro	Val	Ala	Gly	Ile	Cys	Tyr	Val	Gly	Asn	Gln	Ser	Leu	Asp	Asn	465	470	475	480
Leu	Arg	Gly	Phe	Val	Leu	Ala	Pro	Leu	Val	Ile	Tyr	Leu	Phe	Ile	Gly	485	490	495	
Thr	Met	Phe	Leu	Leu	Ala	Gly	Phe	Val	Ser	Leu	Phe	Arg	Ile	Arg	Ser	500	505	510	
Val	Ile	Lys	Gln	Gln	Asp	Gly	Pro	Thr	Lys	Thr	His	Lys	Leu	Glu	Lys	515	520	525	
Leu	Met	Ile	Arg	Leu	Gly	Leu	Phe	Thr	Val	Leu	Tyr	Thr	Val	Pro	Ala	530	535	540	
Ala	Val	Val	Val	Ala	Cys	Leu	Phe	Tyr	Glu	Gln	His	Asn	Arg	Pro	Arg	545	550	555	560
Trp	Glu	Ala	Thr	His	Asn	Cys	Pro	Cys	Leu	Arg	Asp	Leu	Gln	Pro	Asp	565	570	575	
Gln	Ala	Arg	Arg	Pro	Asp	Tyr	Ala	Val	Phe	Met	Leu	Lys	Tyr	Phe	Met	580	585	590	
Cys	Leu	Val	Val	Gly	Ile	Thr	Ser	Gly	Val	Trp	Val	Trp	Ser	Gly	Lys	595	600	605	
Thr	Leu	Glu	Ser	Trp	Arg	Ser	Leu	Cys	Thr	Arg	Cys	Cys	Trp	Ala	Ser	610	615	620	
Lys	Gly	Ala	Ala	Val	Gly	Gly	Gly	Ala	Gly	Ala	Thr	Ala	Ala	Gly	Gly	625	630	635	640
Gly	Gly	Gly	Pro	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Pro	Gly	Gly	Gly	Gly	645	650	655	
Gly	Pro	Gly	Gly	Gly	Gly	Gly	Ser	Leu	Tyr	Ser	Asp	Val	Ser	Thr	Gly	660	665	670	
Leu	Thr	Trp	Arg	Ser	Gly	Thr	Ala	Ser	Ser	Val	Ser	Tyr	Pro	Lys	Gln	675	680	685	

Met Pro Leu Ser Gln Val
690

<210> 11
<211> 591
<212> PRT
<213> Homo sapiens

<400> 11
Met Ala Val Ala Pro Leu Arg Gly Ala Leu Leu Leu Trp Gln Leu Leu
1 5 10 15
Ala Ala Gly Gly Ala Ala Leu Glu Ile Gly Arg Phe Asp Pro Glu Arg
20 25 30
Gly Arg Gly Ala Ala Pro Cys Gln Ala Val Glu Ile Pro Met Cys Arg
35 40 45
Gly Ile Gly Tyr Asn Leu Thr Arg Met Pro Asn Leu Leu Gly His Thr
50 55 60
Ser Gln Gly Glu Ala Ala Ala Glu Leu Ala Glu Phe Ala Pro Leu Val
65 70 75 80
Gln Tyr Gly Cys His Ser His Leu Arg Phe Phe Leu Cys Ser Leu Tyr
85 90 95
Ala Pro Met Cys Thr Asp Gln Val Ser Thr Pro Ile Pro Ala Cys Arg
100 105 110
Pro Met Cys Glu Gln Ala Arg Leu Arg Cys Ala Pro Ile Met Glu Gln
115 120 125
Phe Asn Phe Gly Trp Pro Asp Ser Leu Asp Cys Ala Arg Leu Pro Thr
130 135 140
Arg Asn Asp Pro His Ala Leu Cys Met Glu Ala Pro Glu Asn Ala Thr
145 150 155 160
Ala Gly Pro Ala Glu Pro His Lys Gly Leu Gly Met Leu Pro Val Ala
165 170 175
Pro Arg Pro Ala Arg Pro Pro Gly Asp Leu Gly Pro Gly Ala Gly Gly
180 185 190
Ser Gly Thr Cys Glu Asn Pro Glu Lys Phe Gln Tyr Val Glu Lys Ser
195 200 205
Arg Ser Cys Ala Pro Arg Cys Gly Pro Gly Val Glu Val Phe Trp Ser
210 215 220
Arg Arg Asp Lys Asp Phe Ala Leu Val Trp Met Ala Val Trp Ser Ala
225 230 235 240
Leu Cys Phe Phe Ser Thr Ala Phe Thr Val Leu Thr Phe Leu Leu Glu
245 250 255

Pro	His	Arg	Phe	Gln	Tyr	Pro	Glu	Arg	Pro	Ile	Ile	Phe	Leu	Ser	Met	260	265	270
Cys	Tyr	Asn	Val	Tyr	Ser	Leu	Ala	Phe	Leu	Ile	Arg	Ala	Val	Ala	Gly	275	280	285
Ala	Gln	Ser	Val	Ala	Cys	Asp	Gln	Glu	Ala	Gly	Ala	Leu	Tyr	Val	Ile	290	295	300
Gln	Glu	Gly	Leu	Glu	Asn	Thr	Gly	Cys	Thr	Leu	Val	Phe	Leu	Leu	Leu	305	310	315
Tyr	Tyr	Phe	Gly	Met	Ala	Ser	Ser	Leu	Trp	Trp	Val	Val	Leu	Thr	Leu	325	330	335
Thr	Trp	Phe	Leu	Ala	Ala	Gly	Lys	Lys	Trp	Gly	His	Glu	Ala	Ile	Glu	340	345	350
Ala	His	Gly	Ser	Tyr	Phe	His	Met	Ala	Ala	Trp	Gly	Leu	Pro	Ala	Leu	355	360	365
Lys	Thr	Ile	Val	Ile	Leu	Thr	Leu	Arg	Lys	Val	Ala	Gly	Asp	Glu	Leu	370	375	380
Thr	Gly	Leu	Cys	Tyr	Val	Ala	Ser	Thr	Asp	Ala	Ala	Ala	Leu	Thr	Gly	385	390	395
Phe	Val	Leu	Val	Pro	Leu	Ser	Gly	Tyr	Leu	Val	Leu	Gly	Ser	Ser	Phe	405	410	415
Leu	Leu	Thr	Gly	Phe	Val	Ala	Leu	Phe	His	Ile	Arg	Lys	Ile	Met	Lys	420	425	430
Thr	Gly	Gly	Thr	Asn	Thr	Glu	Lys	Leu	Glu	Lys	Leu	Met	Val	Lys	Ile	435	440	445
Gly	Val	Phe	Ser	Ile	Leu	Tyr	Thr	Val	Pro	Ala	Thr	Cys	Val	Ile	Val	450	455	460
Cys	Tyr	Val	Tyr	Glu	Arg	Leu	Asn	Met	Asp	Phe	Trp	Arg	Leu	Arg	Ala	465	470	475
Thr	Glu	Gln	Pro	Cys	Ala	Ala	Ala	Ala	Gly	Pro	Gly	Gly	Arg	Arg	Asp	485	490	495
Cys	Ser	Leu	Pro	Gly	Gly	Ser	Val	Pro	Thr	Val	Ala	Val	Phe	Met	Leu	500	505	510
Lys	Ile	Phe	Met	Ser	Leu	Val	Val	Gly	Ile	Thr	Ser	Gly	Val	Trp	Val	515	520	525
Trp	Ser	Ser	Lys	Thr	Phe	Gln	Thr	Trp	Gln	Ser	Leu	Cys	Tyr	Arg	Lys	530	535	540
Ile	Ala	Ala	Gly	Arg	Ala	Arg	Ala	Lys	Ala	Cys	Arg	Ala	Pro	Gly	Ser	545	550	555

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<211> 581
<212> PRT
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Ser	Cys	Ala	Ala	Ile	Ser	Ser	Met	Asp	Met	Glu	Arg	Pro	Gly	Asp	Gly	
			20					25					30			
Lys	Cys	Gln	Pro	Ile	Glu	Ile	Pro	Met	Cys	Lys	Asp	Ile	Gly	Tyr	Asn	
		35					40					45				
Met	Thr	Arg	Met	Pro	Asn	Leu	Met	Gly	His	Glu	Asn	Gln	Arg	Glu	Ala	
	50					55					60					
Ala	Ile	Gln	Leu	His	Glu	Phe	Ala	Pro	Leu	Val	Glu	Tyr	Gly	Cys	His	
	65				70					75					80	
Gly	His	Leu	Arg	Phe	Phe	Leu	Cys	Ser	Leu	Tyr	Ala	Pro	Met	Cys	Thr	
				85					90					95		
Glu	Gln	Val	Ser	Thr	Pro	Ile	Pro	Ala	Cys	Arg	Val	Met	Cys	Glu	Gln	
			100					105					110			
Ala	Arg	Leu	Lys	Cys	Ser	Pro	Ile	Met	Glu	Gln	Phe	Asn	Phe	Lys	Trp	
		115					120					125				
Pro	Asp	Ser	Leu	Asp	Cys	Arg	Lys	Leu	Pro	Asn	Lys	Asn	Asp	Pro	Asn	
	130					135					140					
Tyr	Leu	Cys	Met	Glu	Ala	Pro	Asn	Asn	Gly	Ser	Asp	Glu	Pro	Thr	Arg	
	145				150					155					160	
Gly	Ser	Gly	Leu	Phe	Pro	Pro	Leu	Phe	Arg	Pro	Gln	Arg	Pro	His	Ser	
				165					170					175		
Ala	Gln	Glu	His	Pro	Leu	Lys	Asp	Gly	Gly	Pro	Gly	Arg	Gly	Gly	Cys	
			180					185					190			
Asp	Asn	Pro	Gly	Lys	Phe	His	His	Val	Glu	Lys	Ser	Ala	Ser	Cys	Ala	
		195					200					205				
Pro	Leu	Cys	Thr	Pro	Gly	Val	Asp	Val	Tyr	Trp	Ser	Arg	Glu	Asp	Lys	
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Arg	Phe	Ala	Val	Val	Trp	Leu	Ala	Ile	Trp	Ala	Val	Leu	Cys	Phe	Phe	
	225				230					235					240	

Ser Ser Ala Phe Thr Val Leu Thr Phe Leu Ile Asp Pro Ala Arg Phe
 245 250 255
 Arg Tyr Pro Glu Arg Pro Ile Ile Phe Leu Ser Met Cys Tyr Cys Val
 260 265 270
 Tyr Ser Val Gly Tyr Leu Ile Arg Leu Phe Ala Gly Ala Glu Ser Ile
 275 280 285
 Ala Cys Asp Arg Asp Ser Gly Gln Leu Tyr Val Ile Gln Glu Gly Leu
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 Glu Ser Thr Gly Cys Thr Leu Val Phe Leu Val Leu Tyr Tyr Phe Gly
 305 310 315 320
 Met Ala Ser Ser Leu Trp Trp Val Val Leu Thr Leu Thr Trp Phe Leu
 325 330 335
 Ala Ala Gly Lys Lys Trp Gly His Glu Ala Ile Glu Ala Asn Ser Ser
 340 345 350
 Tyr Phe His Leu Ala Ala Trp Ala Ile Pro Ala Val Lys Thr Ile Leu
 355 360 365
 Ile Leu Val Met Arg Arg Val Ala Gly Asp Glu Leu Thr Gly Val Cys
 370 375 380
 Tyr Val Gly Ser Met Asp Val Asn Ala Leu Thr Gly Phe Val Leu Ile
 385 390 395 400
 Pro Leu Ala Cys Tyr Leu Val Ile Gly Thr Ser Phe Ile Leu Ser Gly
 405 410 415
 Phe Val Ala Leu Phe His Ile Arg Arg Val Met Lys Thr Gly Gly Glu
 420 425 430
 Asn Thr Asp Lys Leu Glu Lys Leu Met Val Arg Ile Gly Leu Phe Ser
 435 440 445
 Val Leu Tyr Thr Val Pro Ala Thr Cys Val Ile Ala Cys Tyr Phe Tyr
 450 455 460
 Glu Arg Leu Asn Met Asp Tyr Trp Lys Ile Leu Ala Ala Gln His Lys
 465 470 475 480
 Cys Lys Met Asn Asn Gln Thr Lys Thr Leu Asp Cys Leu Met Ala Ala
 485 490 495
 Ser Ile Pro Ala Val Glu Ile Phe Met Val Lys Ile Phe Met Leu Leu
 500 505 510
 Val Val Gly Ile Thr Ser Gly Met Trp Ile Trp Thr Ser Lys Thr Leu
 515 520 525
 Gln Ser Trp Gln Gln Val Cys Ser Arg Arg Leu Lys Lys Lys Ser Arg
 530 535 540

Arg Lys Pro Ala Ser Val Ile Thr Ser Gly Gly Ile Tyr Lys Lys Ala
545 550 555 560

Gln His Pro Gln Lys Thr His His Gly Lys Tyr Glu Ile Pro Ala Gln
565 570 575

Ser Pro Thr Cys Val
580

